TETRA TECH

December 14, 2016

Mr. Paul Doherty
EPA On-Scene Coordinator
U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

**Subject:** **Emergency Response Report**
**Hydrogen Chloride – MGP, Atchison, Kansas**
**U.S. EPA Region 7 START 4, Contract No. EP-S7-13-06, Task Order No. 0001.031**
**Task Monitor: Paul Doherty, EPA On-Scene Coordinator**

Dear Mr. Doherty:

Tetra Tech, Inc. (Tetra Tech) is submitting the attached Emergency Response Report regarding the Hydrogen Chloride – MGP site in Atchison, Kansas. If you have any questions or comments, please contact the Project Manager at (816) 268-0213.

Sincerely,

Mark Zipf
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

cc: Debra Dorsey, START Project Officer (cover letter only)



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# EMERGENCY RESPONSE REPORT

# HYDROGEN CHLORIDE – MGP, ATCHISON, KANSAS

**Superfund Technical Assessment and Response Team (START) 4**
**Contract No. EP-S7-13-06, Task Order No. 0001.031**

Prepared For:

U.S. Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

December 14, 2016

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## 1.0 INCIDENT

At about 0800 hours on October 21, 2016, a tanker truck was offloading sulfuric acid at the MGP Ingredients Inc. (MGP) wastewater pre-treatment plant in downtown Atchison, Kansas (between 10th and 14th Streets, south of Main Street [see Appendix A, Figure 1]), when the hose from the truck was inadvertently connected to piping leading to a 6,500-gallon aboveground storage tank (AST) containing sodium hypochlorite. A chemical reaction resulted from mixing of these chemicals, causing a large, thick, white plume of gaseous hydrogen chloride and/or chlorine to discharge from the sodium hypochlorite tank and spread to the north over several square miles (see Appendix B). It took 30 to 40 minutes to stop the transfer by closing the valve on the tanker truck. The Atchison Fire Department (AFD) began applying a deluge wash to the sodium hypochlorite tank, knocking down the escaping cloud of gas. Nearby businesses, residences, and schools (including Benedictine College) were evacuated, while others were advised to shelter in place. Some roads were closed for 1-2 hours, including State Route 7 (K-7), U.S. Highway 73, and U.S. Highway 59.

Atchison is a town of approximately 11,000 people in northeast Kansas, about 50 miles northwest of Kansas City. Approximately 100 people sought medical attention for respiratory distress as a result of the release, include five City employees. Mosaic Life Care set up a portable decontamination tent to treat individuals experiencing site-related symptoms of exposure.

At approximately 0930 hours, EPA was notified of the incident and requested assistance from the Tetra Tech Superfund Technical Assessment and Response Team (START) to assess the site. START members Mark Zipf and Nick Wiederholt responded to the incident. The EPA On-Scene Coordinator (OSC) for the response was Paul Doherty.

## 2.0 FACILITY BACKGROUND

MGP has operated at the Atchison location since 1941 and employs about 200 peolple at two locations. MGP processes wheat flour into food ingredients; byproducts from this process are mixed with corn to make alcohol additives used in distilled beverages, food, and pharmaceuticals. Distilled alcohol products, including gin, bourbon, and rye whiskey are also produced. In addition, the company makes plant-based polymers for petroleum-based plastic items, such as disposable cutlery and compact disk cases.

In February 2016, a small explosion occurred at the Atchison plant that resulted in no injuries. However, another explosion occurred at the facility in 2002 when alcolohol vapors escaped through a manhole at the distillery and ignited, injuring two workers who required medical care at a hospital. According to the Kansas Department of Health and Environment (KDHE), MGP has incurred more than $50,000 in penalties since 2006 for issues including exceedance of air pollution limits and failure to install appropriate emissions devices.

## 3.0 EMERGENCY RESPONSE ACTIVITIES

EPA and START arrived at the site at about 1250 hours on October 21, 2016. By that time, the airborne plume had largely dispersed, and the imminent threat to human health appeared to have diminished substantially. First responders and many local, state, and federal government agency personnel were on site. OSC Doherty met with authorities, including the Atchison City Manager, County Emergency Management Director, AFD Incident Commander, KDHE, MGP representatives, and others. Residents who had been advised to shelter in place were cleared to leave their homes.

Coordinates for the AST containing sodium hypochlorite where the release occurred were determined to be 39.558716 degrees north latitude and 95.132491 degrees west longitude. START was tasked to perform perimeter real-time air monitoring. START used a MultiRAE Pro multi-gas detector (with oxygen, combustible gas, chlorine, volatile organic compound [VOC], and gamma radiation sensors) and a MultiRAE Plus multi-gas detector that included a hydrogen sulfide sensor to acquire and record readings at 11 locations around the MGP facility. The readings were taken between 1430 hours and 1620 hours, and all readings were non-detect except for oxygen, which was 20.9% at all locations. A summary of the air monitoring locations is included in Table 1 below. The air monitoring locations are also shown on Figure 2 in Appendix A.

## TABLE 1

## REAL-TIME AIR MONITORING READINGS
## HYDROGEN CHLORIDE – MGP SITE, ATCHISON, KANSAS

| Location[1] | Description | Latitude (°N) | Longitude (°W) | $O_2$ (%) | LEL (%) | $Cl_2$ (ppm) | VOCs ($ppm^2$) | $H_2S$ (ppm) |
|---|---|---|---|---|---|---|---|---|
| MRPro1 | Gasoline Alley (maintenance building) | 39.55902892 | 95.13120859 | 20.9 | 0 | 0 | 0 | NA |
| MR2 | Hwy 73 and Gasoline Alley | 39.55942542 | 95.12768081 | 20.9 | 0 | 0 | 0 | 0 |
| MR3 | Hwy 59 and Hwy 73 (NW corner) | 39.55890893 | 95.12754444 | 20.9 | 0 | 0 | 0 | 0 |
| MR4 | Leopoldo's Greenhouse | 39.55785398 | 95.13154546 | 20.9 | 0 | 0 | 0 | 0 |
| MR5 | 14th Street and Hwy 59 (NE corner) | 39.55731628 | 95.13524939 | 20.9 | 0 | 0 | 0 | 0 |
| MR6 | Bridge on 14th Street (E side) | 39.55918198 | 95.13541974 | 20.9 | 0 | 0 | 0 | 0 |
| MR7 | 14th Street and Main Street (NW corner) | 39.56076037 | 95.13541915 | 20.9 | 0 | 0 | 0 | 0 |
| MR8 | 13th Street and Main Street (S side) | 39.56082889 | 95.13320306 | 20.9 | 0 | 0 | 0 | 0 |
| MR9 | MGP parking lot (E side of plant) | 39.56063279 | 95.13116215 | 20.9 | 0 | 0 | 0 | 0 |
| MR10 | 10th Street and Main Street (SW corner) | 39.56057726 | 95.12872512 | 20.9 | 0 | 0 | 0 | 0 |
| MR11 | Incident site (30 feet N of tanks) | 39.55880026 | 95.13252413 | 20.9 | 0 | 0 | 0 | 0 |

Notes:

[1] See Figure 2 in Appendix A
[2] Concentration above background level

| | | | |
|---|---|---|---|
| $Cl_2$ | Chlorine | NW | Northwest |
| E | East | $O_2$ | Oxygen |
| $H_2S$ | Hydrogen sulfide | ppm | Parts per million |
| Hwy | Highway | S | South |
| LEL | Lower explosive limit | SW | Southwest |
| MR | MultiRAE Plus (instrument used to obtain air monitoring readings) | VOC | Volatile organic compound |
| MRPro | MultiRAE Pro (instrument used to obtain air monitoring readings) | W | West |
| N | North | ° | Degrees |
| NA | Not applicable | % | Percent |
| NE | Northeast | | |

An MGP contractor (Haz-Mat Response Inc.) was on site at the time START and EPA arrived. Although the valve on the tanker truck had been closed for a few hours, it was necessary for the tanker to depressurize before the hose could be disconnected. The AFD stayed on site until the hose from the tanker truck could be disconnected. As soon as the AFD left at 1650 hours, Haz-Mat Response Inc. began deploying 2,000-gallon portable tanks to the site; the contents of the 6,500-gallon sodium hypochlorite tank would be transferred to the portable tanks. The transfer operation was expected to be completed by 2200 hours.

Another MGP contractor, the Center for Toxicology and Environmental Health (CTEH), was also on site to conduct air monitoring at the facility and throughout the Atchison community, and to provide information to the public regarding health impacts from exposure to the airborne release. EPA and START left the site at 1745 hours.

## 4.0 SUMMARY

On October 21, 2016, START assisted EPA with emergency response activities at the MGP Ingredients, Inc. facility in Atchison, Kansas. The response was to assess an accidental release of a hydrogen chloride and/or chlorine gas plume. The release was caused by mixing sulfuric acid and sodium hypochlorite, which initiated an immediate reaction that resulted in the expulsion of a manhole cover from an AST containing the sodium hypochlorite. The airborne plume spread over several square miles. It took 30 to 40 minutes to close the valve on the tanker truck delivering the sulfuric acid. START was tasked to perform perimeter air monitoring and found no readings for chlorine, hydrogen sulfide, or VOCs above background levels. Also, no explosive atmospheres or oxygen-enriched/suppressed conditions were identified.

An investigation of the incident by the U.S. Chemical Safety Board (CSB) was subsequently performed. The CSB is an independent federal agency that investigates industrial chemical accidents. CSB investigations evaluate various aspects of chemical accidents, including physical causes such as equipment failures, as well as improper adherence to regulations, industry standards, and safety management systems. Investigations were also conducted by the U.S. Food and Drug Administration (FDA) and the Occupational Safety and Health Administration (OSHA).

# APPENDIX A

# FIGURES

# APPENDIX B

# PHOTOGRAPHIC DOCUMENTATION